

*Recent Research in Science and Technology* 2010, 2(11): 40-48  
ISSN: 2076-5061  
[www.recent-science.com](http://www.recent-science.com)



MEDICAL SCIENCES

## EFFECT OF INTEGRATED TEACHING VERSUS CONVENTIONAL LECTURING ON MBBS PHASE I STUDENTS

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### Abstract

Advances in scientific knowledge and innovations in educational field that necessitates constant change in medical school curricula. At present in our Institution the existing system of undergraduate curriculum for MBBS I phase is non integrated, discipline based where in teaching involves only didactic lectures, fully teacher centered process, tutorials and to a lesser extent with group discussion. Each subject has its own block of time usually restricted to one part of the course. Therefore there are many flaws in present teaching system. Students are passive learners, no exposure to critical thinking, no active learning, difficulty in co relating all three preclinical subjects and apply this knowledge & transfer this information into clinical practice. To improve quality of the students and to have effective diagnosis, for better treatment of the patients. Integrated teaching is the need of the hour, and students learn better when engaged by different materials of learning. This alternative method of teaching would be beneficial to the student community at the institution and would be an ideal approach. Students will learn in context of medical problem integrating all three basic science subjects, understand and correlate basis of clinical problem and will enhance clinical learning.

**Keywords:** Traditional lecturing, Integrated teaching, Improved knowledge clinical correlation, Effective diagnosis

### Introduction and background

There are many advances in scientific knowledge and innovations in educational field that necessitates constant changes in medical school curricula. This is for the benefit of society. There are many innovations and trends in medical education that have been undertaken globally which include self directed learning, problem based learning, integrated teaching and community orientation (Smith S.R.; 2005).

The way of connecting skills and knowledge from multiple sources and experiences or applying skills and practice in various settings is integrated teaching. It simply means bridging connections between academic knowledge and practicals (Huber M.T., P. Hutchings; 2004). An integrated curriculum refers to a non compartmentalized approach to basic science learning, in which course of study is instead organized around organ systems like cardiovascular system, gastro intestinal system, respiratory system etc. Barzansky Barbara, Jonas Harry S., Etzel Syla I, 1989). Medical education basically aims to produce medical personnel having sound clinical competences and community orientation with proficient communication skills. All these are very essential to solve formidable health problems (Paul V. K.; 1993).

With the existing medical practices, there is a general dissatisfaction. The main reason for such

dissatisfaction has been identified as the present day medical curricula (World Health Organization; 1981).

There is tremendous responsibility on the institutions providing medical education for bringing about required innovations in the existing system. This is to meet the defined needs of the societies (The Edinburgh Declaration; 1988). The Medical council of India has stressed upon need-based curriculum, that should stimulate student's interest and inculcate drive to learn more. This should be through an active self directed approach rather than through didactic teaching. Teachers assume new role of facilitating the process of active learning rather than overloading students with excessive details through a series of elaborate lecture and voluminous book. This way of learning that is, student centered approach is expected to make learning a pleasure and subsequent use of knowledge base in an effective manner in clinical practice. This should benefit the community and meet their needs. All over the world there are 1350 medical schools out of which 140 are in India. Majority of these medical schools follow traditional curricula in teaching. This is disciplined based, teacher centered, examination oriented, where in learners are presented with a series of discipline or building blocks in isolation. Such modules are under criticism for placing too much emphasis on memorization of facts and figures and for overloading the students with excessive details (Harden R. M.; Sowden S.; Dunn W. R.; 1984). As a

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result, students are unable to correlate the basis of clinical problems or cases. As they are unable to correlate in context of a clinical problem it could affect quality of diagnosing and treatment of a patient.

To improve the quality of students and to have effective diagnosis and better treatment of the patients, integrated learning is the need of hour. In recent years through out the world such curricula have been used by faculties to teach the students (Irby D. Wilkerson; 2003; Shimra T. Araurahi; 2004; Damegh S. A.; 2005; Ghosh S. Pandya; 2008; Vyas R. Jacob; 2008; Ludmerer K. M., Shankar P. R.; 2009).

Medical educationists realized that there was need for integrating basic and clinical medical sciences (Muller J. H., Jain S., Loeser H., Teby D. M.; 2008) and an integrated approach with strong clinical relevance captures students attention and creates more excitement in learning (Custers E.J., Cate O.T.; 2006). The students trained with such a integrated curriculum, make more accurate diagnosis than did students trained in a conventional curriculum (Schmidt H. G., Machiele M., Hermam Bongaerts H., Den Cate T. J., Vinekamp R., Boshuize H. P.; 1996).

There are four major components in integrated teaching namely 1. Integration of experience 2. Social integration 3. Integration of knowledge 4. Integration as a curriculum design. It differs from other types of interdisciplinary teaching in that it begins with a central theme (Beane J.; 1997).

To be an effective teacher the faculty members must have content knowledge, pedagogical knowledge and knowledge of the learner and his/her characteristic. They should understand their students learning attitude and learning styles preferences (Gudmundittir, S., Shulman L.; 1987).

Learning style is defined as the manner and conditions under which the learner most efficiently and effectively perceive, processes, stores and recalls what they are attempting to learn (Jamu, W., Gardner D.; 1995).

It is said that students learn best when they are engaged by different materials of learning presented in variety of ways and formats (Tennyson R.D.; 1998).

Physiology like any other branch of medicine is progressing by laps and bounds. For the improvement in undergraduate medical course, teaching and evaluation methods must be modified at regular intervals and for this, modifications of methodologies is a must. The course assessment instruments like feedback help the faculty identify the strength and weaknesses of their teaching and evaluation methods (Ruth, N.; 2000; Richardson, B. K.; 2004).

In developing teaching and evaluation strategies it is very important for the teachers to obtain a feedback. This will basically allows them to modify their methods to meet the needs of students (Victoroff K. Z., Hogan S.; 2006). An inexpensive and invaluable tool to

improve the quality of teaching is to get a feedback from students regarding teaching and evaluation methods which is the best method available to bridge the communication gap between students and teachers (Sehgal R., Dhir V, Sawhney A.; 1998).

At present in Jawaharlal Nehru Medical College, Belgaum the existing system of undergraduate curriculum for MBBS 1st phase for one year duration is non-integrated, discipline based where in teaching activity involves lecturing and is vertically integrated. The three preclinical departments of Physiology Anatomy and Biochemistry teach their respective subjects with didactic lectures, tutorials and to a lesser extent with group discussion. The number of teaching hours are stipulated to respective departments. Each subject has its own block of time usually restricted to one part of course is at different phases of the curriculum. For example, in teaching pancreas as a part of the endocrine system, structural part will be dealt by an anatomist in beginning of the course, its metabolism will be dealt by a biochemist in midway of course, while its actions with respect to hormonal mechanism will be dealt by a physiologist at the end of the course.

Lecturing is fully teacher centered process. Students are given update of the factual materials in direct and logical manner and this has got a number of limitations.

1. Communication is one way.
2. Experts are not always good teachers.
3. Audience is passive.
4. Learning is difficult to gauge.
5. Proficient oral skills are necessary.

Lecture should contain clear introduction and summary. As it is audience specific it must include examples.

Hence there are many flaws in the present teaching system that is employed in our setup.

1. Students are passive listener.
2. There is no exposures to critical thinking.
3. No active learning.
4. Students find it difficult to correlate all three preclinical subjects and apply their knowledge and transfer this information of clinical practice.
5. Discourages students from learning.
6. There is lot of confusion in their minds and therefore subject as a whole is never grasped.
7. Unnecessary repetition.

Feedback taken from a second year para clinical faculty, it was understood that the students failed to correlate all the three pre clinical knowledge which would help to understand the para clinical subjects better. For example, in pathology, when "Inflammation" was being discussed about a particular organ, it was

found that, students were unable to correlate all the three subjects together that is what is the physiological process and various biochemical changes taking place that led to process of inflammation. The teacher had to definitely spend some time in discussing the basics, making the students recall of the things they had learned in the first year of their course as well as correlate them to understand the subject and then move on with the subject proper.

Having known this as a problem of our organization and as a teacher myself for preclinical sides, I personally felt that to overcome all of the above problems, to make students understand better we could think of introducing an alternate method of teaching in the first year for better understanding and correlating three subjects by the students.

Though the method of integrated teaching is followed in the para clinical side, it is a modified method of teaching, planned to introduce and study the effect of Integrated teaching versus conventional lecturing on MBBS Phase I students. Integrated teaching programme should provide students with the opportunities to correlate, integrate and think critically which is very much necessary. In the present teaching scenario all the body systems are taught by conventional lecture. This is observed in all the three departments. Each department provides individual lecture classes at their own pace of time during first year undergraduate course. Although a curriculum change to integrate the three departments would be beneficial, it is not sufficient without considering the instructional design that would facilitate the process of learning. This will be a horizontal integration, where in all the three departments teach concurrently merging their educational activities, where in topics are presented in a more meaningful way and students learn to apply their knowledge because of better understanding. Students will have a better insight and can efficiently correlate forms and functions of systems concerned, its metabolism, diseases etc.

As a means of establishing a model for an integrated curriculum that bases itself on all instructional designs planned to develop higher order learning skills and long terms memory, here is a module designed to teach the Gastro Intestinal System.

Based on the scholarly articles (literature survey) and initiative belief, this alternative method of teaching is believed to be beneficial to the student community at the institution and would the ideal approach for students because of the following reasons.

1. System wise teaching (Block wise).
2. Integration along with case oriented approach.
3. Student centered (learner's oriented)
4. Promotes interdepartmental collaboration.
5. Students learn to apply their knowledge to clinical practical.

6. Prevents repetition and wastage of time.
7. Approach improves understanding and students develop interest to topic.

Outcome of implementing this module would be on;

1. Short tem basis
  - a. As far knowledge is concerned students will learn in context of medical problem integrating all the three basic sciences subjects.
  - b. Understand and correlate basis of clinical problems/cases/diseases.
  - c. Enhances clinical learning.
2. Long term basis
  - a. Improved academic standard of doctor.
  - b. Improved diagnosis and treatment.
  - c. Provide better health care.
  - d. Improved patients satisfaction
  - e. Overall improved community health.

Implementation of new method of teaching in physiology, leadership difficulties possibly would be the involvement of other department's anatomy and biochemistry whose co-operation and consent is very much essential for integration of this system. Hence the following difficulties may be encountered.

1. Lack of co-operation from other departments.
2. Additional work for staff members in organizing the module.
3. Colleagues from own department may not support in implementation procedure.
4. Lack of expert facilitators.
5. Difficulty in framing time table with number of teaching hours allotted to the three different preclinical subjects.
6. Ignorance of few faculty members.

In the traditional methods of teaching MBBS first year curriculum, students do not learn concepts and find it difficult to correlate. Only theoretical knowledge is imparted to students and teaching learning method is only lecture based. Discussion among peers (student to student) is lacking and there is no interaction among them. There is no student teacher interaction. Course content that is, curriculum design and objectives are not clearly defined, even the learning environment is not effective for students. Hence it is thought to be an instructional problem.

Present teaching scenario of conventional teaching does not include David Merrill's principles. 1. Problem based learning 2. Application 3. Integration is not followed in traditional teaching. Activation, very few teachers do this but everyone does not follow this principle of teaching. As far as demonstrations are concerned, there are no live demonstrations in lecture

classes. However in practical, teachers do the demonstration, students see and learn to perform under teachers supervision (Merrill M. D., 2002).

Similarly this present traditional way of teaching does not follow all the theories put forth by Robert Gagne's in the process of learning that is, cognitive strategies, intellectual skills, motor skills, attitude and verbal information. The existing proficiencies are cognitive (knowledge and problem solving abilities to some extent) and effective to some extent. While there are no psychomotor skills and capabilities are seen. Verbal information without active learning is followed (Gagne R., 1985).

Traditional way of teaching does not follow Kolb and Kolb theory of learning process. Learning is not based on concrete experience that is, there are no discussions and feedback approach to teaching. Students are receptive and just receive whatever is delivered to them, students are not involved in knowing new experiences, that is there is no reflective observations. Students are not made to think logically so that they derive to some conclusion applying the knowledge they know (Svinicki M. D., N. M. Dixon, 1987).

Hence there is no scope for abstract conceptualization neither there is active experimentation, no feedback approach or discussions in process of learning.

#### Need of integration

This is an educational programme which has better chances of being more effective teaching method, as it improves the cognitive and psychomotor domains of students and also enhance their skills to correlate clinically improve their diagnosis skills as well that will benefit the society as better clinicians. It also removes subject phobia and develop interest in topic.

#### Objectives of the study

1. To develop and implement a module for GIT focusing on integrated teaching.
2. To see the effect of the integrated teaching for first year MBBS students.
3. To observe the impact of integrated teaching on performance of students.
4. To compare and evaluate integrated teaching with traditional educational system.
5. Making students understand and apply the basic science concept in health and disease better.

#### Methodology

Module – Gastro-Intestinal System for MBBS Phase I students

Topic – Liver

#### Sampling

A randomized sampling will be done for selection of students and for allocation of groups.

#### Selection

Target learners: 100 first year MBBS students divided into two groups.

Group I – 50 students with all odd roll numbers.

Group II – 50 students with all evens roll numbers.

By lottery method it will be decided, (2 chits with odd and even numbers, 1 chit randomly picked by any student) will decide which group among the two will go for Integrated teaching.

For example: Chit with even numbers is picked up then group II will go for Integrated teaching and group I will go for traditional teaching methods.

Earlier all the 100 students would have been exposed to traditional teaching for other systems like Haematology, Respiratory, Renal System Reproductive Systems etc.

#### Procedure

##### *Department level*

- a. Discussion of the same issue with the head of department of physiology.
- b. Conducting faculty development meeting to sensitize faculty members of the department regarding Integrated teaching and its implementation procedure.

##### *Inter-department level*

- a. Orientation programme to the process of implementing an Integrated teaching module for entire faculty members of departments of anatomy, biochemistry and physiology.
- b. Open discussions among faculty members to ensure time Integration of different topics both horizontally and vertically.
- c. Framing of Time Table for Integrated teaching module regarding number of hours allotted to the three different preclinical subjects

##### *Group I*

- a. Group I with odd roll numbers will go for conventional way of teaching.
- b. They learn about gross anatomy of liver and biliary system (Anatomy) with practicals as well, study about Biliary secretion (Physiology) and Liver function test and Biliary metabolism (Biochemistry) at their own pace of time.
- c. Pretest questionnaire with a set of 25 MCQs will be given before their first lecture class and a post test with same set of MCQs will be given after completion of topic irrespective of time.

### Group II

- a. Group II students with all even numbers will go for the Integrated teaching programme (module) and will follow the time table schedule for one week on the above topic (Annexure I). All the major topics will be covered in eight sessions. Each topic will be discussed with respect to structure, function and clinical correlation. Before the start of each session, student will undergo a pretest with the same set of 25 MCQs. At the end of each week a post test with same set of MCQs will be taken.

*Comparison of the post test results of both the groups will enable the investigator to compare the performances of both the groups and rate which one is a better method of teaching.*

### Instructional methods

Topics will be delivered by means of following teaching and learning methods.

1. Didactic lectures: Each of one hour duration will be conducted by preclinical faculty to give the basic concept to the students, which includes structured components by an anatomist, various enzymes and their physiological actions by faculty of physiology and metabolism by biochemistry faculty. Discussion with students to question and clarify doubts will also be incorporated. These lectures will aim at providing conceptual organizing frame work for students rather than delivering factual information and they also acquire competency in core abilities. It also allows every student to participate in all active process.
2. Case stimulated interactive lessons – (2 to 2 ½ hours duration each session) this involves large group lectures with presentation of case scenarios. Following this student will be divided into small groups. Ten groups of five students each. They will participate in group discussion (small group discussion) and later one student from each group on rotation will present his groups view regarding the case, of five to six minutes duration each.

Case based learning here will develop analytical and problem solving skills, help student to apply new knowledge and skills. This also allows to active thinking and critical analysis for complex issues. It also enhances clinical learning.

Small group discussion favours participation of everyone, as students are

more comfortable in small groups. They are made to prepare specific tasks for the group to answer to the solution. All students when they work in groups, it enhances their reasoning abilities as well.

3. Group seminars – Students of these 10 groups will be assigned topics of clinical relevance for their presentation. Each group will be given task of preparing seminar under the guidance of preclinical faculty. Thereafter one person from each group will present on rotation basis to large group also being attended by faculty from all three departments. Each presentation will last for about 10 minutes followed by interaction sessions among students and brain storming sessions between students and teachers. This entire programme will last for two to two and half hours and will finally end with summing up with faculty.

Group seminars enhance active participation of students and will also improve their communication and presentation skills. Brain storming session will allow creative thinking of new ideas as one idea can spark off other new ideas. This also encourages full participation from the students.

This whole module will be conducted over a period to two months (eight sessions) after completion of module students feedback will be collected by using a questionnaire which will have following themes incorporated into it.

1. Utility and effectiveness of ITP as mean of teaching method.
2. Rating of various teaching methods.
3. Free comment sessions with suggestions regarding new method implemented in teaching (Annexure II).

Faculty feedback will also be taken as end of module to find level of satisfaction with respect to activities related to implementation as well as their likes and dislikes (Annexure III).

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MBBS First year 2010-2011 academic session  
ANNEXURE – I

Block: Gastro-intestinal tract				Topic: Liver		
Days	Timing					
	9-10 am	10-11 am	11-12 am	2-3 pm	3-4 pm	4-5 pm
Monday	Lecture - Anatomy theory – Gross anatomy of liver	-	-	Anatomy practical and demonstration on liver and biliary system		
Tuesday	-	Lecture - Physiology theory – Biliary system	-	-	Physiology – Discussion about liver biopsy	-
Wednesday	Lecture - Biochemistry Theory– Biliary Metabolism	-	-	Biochemistry – Liver Function Tests Practical and demonstration		
Thursday		Presentation and discussion about case scenarios Group formation and allotment of work		Self study (Group discussion)	Group presentation about cases (5-6 min each group)	
Friday		Allotment of topics for group seminar				
Saturday	Group seminars 10 minutes duration each Interactive sessions Brain storming sessions Summing up			Collection of feedback	Post test questionnaire and Assessment	-

## ANNEXURE – II

### Response of students

1. Regarding usefulness of didactic lectures with discussions, seminars and group presentations under three headings

a. Very useful

b. Useful

c. Not useful

In understanding a particular topic with correlation of three preclinical subject integrated teaching is.

- ii In understanding a given topic didactic lectures with discussion.

- iii In case based learning exchange of ideas taking place in group discussion.

- iv Case presentation with discussion in small groups.

- v Seminars and brain storming sessions incorporated into integrated teaching

- vi Knowledge learnt with Integrated Teaching Programme, keeps you to perform better in examination is;


2. Rating different methods of teaching by students under four headings

a. Poor

b. Good

c. Excellent

d. No response

- i Didactic lectures with open discussion

7

ii	Case stimulated interactive lectures.	<input type="checkbox"/>
iii	Small groups discussions and presentation regarding case scenarios	<input type="checkbox"/>
iv	Student seminars	<input type="checkbox"/>
v	Brain storming and interactive sessions	<input type="checkbox"/>
vi	Practical exercise in laboratory	<input type="checkbox"/>
vii	Demonstration in laboratory	<input type="checkbox"/>
viii	Usefulness of Integrated Teaching Programme	<input type="checkbox"/>

#### Free Comment Sections for Students

Various themes for free comments, regarding various aspects of integrated teaching programme (module) gastro intestinal tract

- i Concept of ITP and its implementation.
- ii Whether rest of the system, should be taught in an integrated manner.
- iii Usefulness about integrated teaching programme (ITP) for better understanding and correlation
- iv Time of implementation.
- v Framing of time table and allocation of teaching course.
- vi Various instructional methods used to deliver Integrated Teaching Programme.
- vii Assessment of Integrated teaching programmes as a whole.

#### ANNEXURE - III

#### Feedback from faculty

1. Regarding level of satisfaction of ITP under three headings
  - a. Satisfactory
  - b. Not satisfactory
  - c. No response

i	Integrated teaching programme is a useful method of teaching	<input type="checkbox"/>
ii	Methodology of teaching in various instructional methods that were followed	<input type="checkbox"/>
iii	Method of framing the time table	<input type="checkbox"/>
iv	Mode of delivering the contents to students	<input type="checkbox"/>
v	Way of assessing students	<input type="checkbox"/>



vi Evaluation of programme

☐

2. Regarding their likes and dislikes about the programme under three headings

a. Liked

b. Did not like

c. No response

i About implementation of Integrated Teaching Programme in the department.

☐

ii Way in which programme was implemented

☐

iii Discussion and conclusions from three interdepartmental faculty (Physiology, Chemistry and Anatomy)

iv Integrated assessment of students

☐

v Various group activities (Small group discussion and presentation / seminars)

☐

vi Concept of implementing Integrated Teaching Programme

☐
☐

Free Comment Sections for both Students and Faculty

Various themes for free comments, regarding various aspects of integrated teaching programme (module) gastro intestinal tract

i Concept of Integrated Teaching Programme and its implementation.

ii Whether rest of the system, should be taught in an integrated manner.

iii Usefulness about integrated teaching programme (ITP) for better understanding and correlation

iv Time of implementation.

v Framing of time table and allocation of teaching course.

vi Various instructional methods used to deliver Integrated Teaching Programme.

vii Assessment of integrated teaching programmes as a whole.